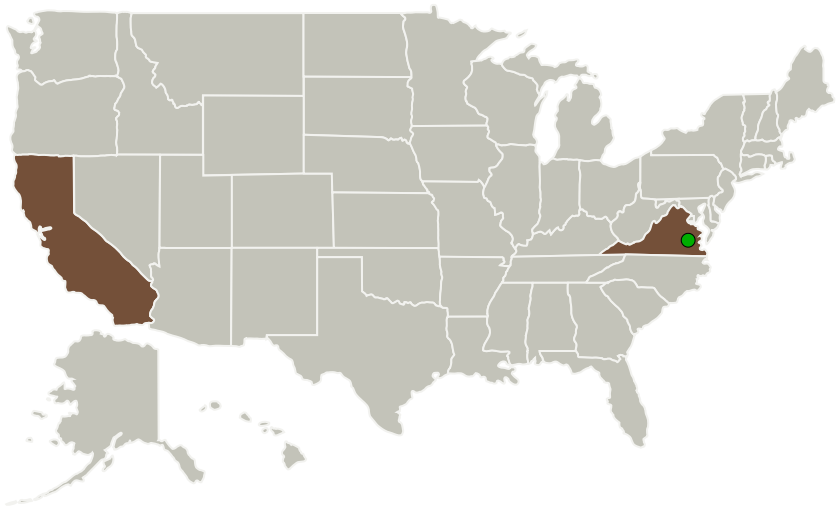
Ultra-Sensitive Instrument for Gas Turbine Black Carbon Emissions Measurements, Phase I

Completed Technology Project (2012 - 2012)

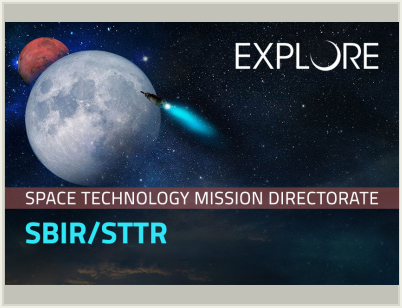
Project Introduction

This proposal address innovations to the Laser-Induced Incandescence method aimed at (1) improving the lower detection limit of soot volume fraction by as much as two orders of magnitude and increasing overall measurement range by two orders of magnitude to meet new regulation that are in place or anticipated and (2) provide PM mean volumetric particle size and number density measurement capabilities. The proposed advances in the LII technique will substantially increase the capabilities for real-time particulate matter measurements over any engine transient operation. It will also have several orders of magnitude greater sensitivity than the gravimetric techniques or any other available method. The wide dynamic range and lower detection limit of LII will make this technique the preferred standard instrument for particulate matter measurements.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Artium Technologies	Lead Organization	Industry	Sunnyvale, California
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia



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Primary U.S. Work Locations	
California	Virginia

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138553)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Artium Technologies

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

William D Bachalo

Co-Investigator:

William Bachalo

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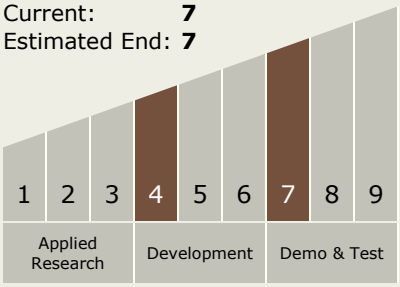
Completed Technology Project (2012 - 2012)

Technology Maturity (TRL)

Start: **4**
Current: **7**
Estimated End: **7**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System